



EM125015763US

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SEQUENCE LISTING

<110> LU, PATRICK Y.
XIE, FRANK Y.
WOODLE, MARTIN C.
LIU, YIJIN
TANG, QUINN Q.
XU, JUN

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<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 18
aaugcggaga acacuaauua u

21

<210> 19
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 19
aatgacaagg cacatcgatg t

21

<210> 20
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 20
aaugacaagg cacaucgaug u

21

<210> 21
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 21
aagctggaca ttccctctgc g

21

<210> 22
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 22
aagagcccaag ctccctgcag c

21

<210> 23
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 23
aactgtttag gagcccatgg a 21

<210> 24
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 24
aatctgatga tgaagctgca g 21

<210> 25
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 25
aagagcccaag cttcctgcag c 21

<210> 26
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 26
aagctggaca ttccctctgc g 21

<210> 27
<211> 152
<212> PRT
<213> Homo sapiens

<400> 27
 Ala Leu Arg Asn Trp Gln Val Tyr Arg Leu Val Thr Tyr Ile Phe Val
 1 5 10 15
 Tyr Glu Asn Pro Ile Ser Leu Leu Cys Gly Ala Ile Ile Ile Trp Arg
 20 25 30
 Phe Ala Gly Asn Phe Glu Arg Thr Val Gly Thr Val Arg His Cys Phe
 35 40 45
 Phe Thr Val Ile Phe Ala Ile Phe Ser Ala Ile Ile Phe Leu Ser Phe
 50 55 60
 Glu Ala Val Ser Ser Leu Ser Lys Leu Gly Glu Val Glu Asp Ala Arg
 65 70 75 80
 Gly Phe Thr Pro Val Ala Phe Ala Met Leu Gly Val Thr Thr Val Arg
 85 90 95
 Ser Arg Met Arg Arg Ala Leu Val Phe Gly Met Val Val Pro Ser Val
 100 105 110
 Leu Val Pro Trp Leu Leu Leu Gly Ala Ser Trp Leu Ile Pro Gln Thr
 115 120 125
 Ser Phe Leu Ser Asn Val Cys Gly Leu Ser Ile Gly Leu Ala Tyr Ala
 130 135 140
 His Leu Leu Leu Phe His Arg Pro
 145 150

<210> 28
<211> 152
<212> PRT
<213> *Saccharomyces cerevisiae*

<400> 28
 Leu Leu Gln Lys Arg Gln Leu Tyr Glu Ile Ile Thr Tyr Val Thr Leu
 1 5 10 15
 His Leu Ser Met Leu His Ile Val Phe Asn Phe Val Ser Leu Leu Pro
 20 25 30
 Ala Met Ser Gln Phe Glu Lys Lys Gln Gly Thr Leu Ala Cys Ile Leu
 35 40 45
 Val Thr Val Ile Pro Tyr Thr Leu Phe Pro Gly Ile Met His Leu Ile
 50 55 60
 Val Tyr His Phe Phe Leu Arg Lys Asp Tyr Val Ser Ile Ala Gly Leu
 65 70 75 80
 Ser Gly Trp Ala Phe Ala Phe Ile Ser Ala Ser Cys Val His Ser Pro
 85 90 95

Gln Arg Leu Ile Ser Phe Phe Asn Leu Phe Ser Ile Pro Ala Tyr Cys
 100 105 110

Phe Pro Ile Ile Tyr Leu Ile Met Thr Thr Ile Leu Val Pro Lys Ala
 115 120 125

Ser Phe Ile Gly His Ala Ser Gly Ala Val Met Gly Tyr Cys Thr Pro
 130 135 140

Phe Met Leu Gly Ser Ile Pro Leu
 145 150

<210> 29

<211> 145

<212> PRT

<213> Schizosaccharomyces pombe

<400> 29

Pro Arg Ser Leu Glu Gly Leu Arg Gly Ile Val Phe Ala Pro Phe Leu
 1 5 10 15

His Ala Asp Phe Gly His Leu Ile Ala Asn Ser Val Pro Phe Val Val
 20 25 30

Leu Ala Trp Leu Val Met Leu Gln Glu Val Ser Asp Phe Trp Ile Val
 35 40 45

Thr Ile Ile Thr Met Val Val Gly Gly Leu Gly Val Trp Leu Ile Ala
 50 55 60

Pro Pro Asn Thr Val Thr Val Gly Ala Ser Ile Leu Ile Phe Gly Tyr
 65 70 75 80

Leu Gly Phe Leu Leu Phe Arg Gly Trp Phe Gln Lys Asn Leu Ala Ser
 85 90 95

Ile Val Leu Ser Ile Val Val Leu Val Leu Tyr Gly Ser Ala Leu Trp
 100 105 110

Gly Leu Leu Pro Gly Arg Ala Gly Val Ser Trp Gln Gly His Leu Phe
 115 120 125

Gly Phe Ile Gly Gly Ala Ile Ala Ala Trp Leu Ile Ala Arg Glu Lys
 130 135 140

His
 145

<210> 30

<211> 145

<212> PRT

<213> Saccharomyces cerevisiae

<400> 30

Ser Lys Ser Asn Ala Arg Pro Val Val Ala Ile Gly Asp Ser Asp Ile
 1 5 10 15

Tyr Ser Tyr Arg Leu Trp Ser Phe Phe Cys Gln Trp Ile Asn Thr Ile
 20 25 30

Phe Cys Trp Ser Asn Arg Arg Pro Leu Gly Leu Thr Pro Phe Leu
 35 40 45

Leu Leu Tyr Val Leu Ser Gly Val Met Gly Asn Ala Phe Thr Phe Trp
 50 55 60

Leu Thr Pro Glu Thr Val Ala Ala Gly Ala Ser Thr Ser Leu Phe Gly
 65 70 75 80

Leu Phe Ala Ala Ile Val Val Leu Ser Phe Leu Gly Lys Asn Gln Ala
 85 90 95

Leu Lys Asp Leu Gly Lys Ser Tyr Gln Thr Leu Ile Val Val Asn Leu
 100 105 110

Leu Met Asn Leu Phe Met Pro Asn Val Ser Met Ala Gly His Ile Gly
 115 120 125

Gly Val Val Gly Gly Ala Leu Leu Ser Ile Val Phe Pro Thr Lys Met
 130 135 140

Arg
 145

<210> 31
 <211> 156
 <212> PRT
 <213> Homo sapiens

<400> 31
 Pro Glu Lys Arg Glu Glu Ala Trp Arg Phe Ile Ser Tyr Met Leu Val
 1 5 10 15

His Ala Gly Val Gln His Ile Leu Gly Asn Leu Cys Met Gln Leu Val
 20 25 30

Leu Gly Ile Pro Leu Glu Met Val His Lys Gly Leu Arg Val Gly Leu
 35 40 45

Val Tyr Leu Ala Gly Val Ile Ala Gly Ser Leu Ala Ser Ser Ile Phe
 50 55 60

Asp Pro Leu Arg Tyr Leu Val Gly Ala Ser Gly Gly Val Tyr Ala Leu
 65 70 75 80

Met Gly Gly Tyr Phe Met Asn Val Leu Val Asn Phe Gln Glu Met Ile
 85 90 95

Pro Ala Phe Gly Ile Phe Arg Leu Leu Ile Ile Leu Ile Ile Val
 100 105 110

Leu Asp Met Gly Phe Ala Leu Tyr Arg Arg Phe Phe Val Pro Glu Asp
 115 120 125

Gly Ser Pro Val Ser Phe Ala Ala His Ile Ala Gly Gly Phe Ala Gly
 130 135 140

Met Ser Ile Gly Tyr Thr Val Phe Ser Cys Phe Asp
 145 150 155

<210> 32
 <211> 145
 <212> PRT
 <213> Escherichia coli

<400> 32
 Pro Thr Leu Lys Phe Glu Phe Trp Arg Tyr Phe Thr His Ala Leu Met
 1 5 10 15

His Phe Ser Leu Met His Ile Leu Phe Asn Leu Leu Trp Trp Trp Tyr
 20 25 30

Leu Gly Gly Ala Val Glu Lys Arg Leu Gly Ser Gly Lys Leu Ile Val
 35 40 45

Ile Arg Ser Ile Ser Ala Leu Leu Ser Gly Tyr Val Gln Gln Lys Phe
 50 55 60

Ser Gly Pro Trp Phe Gly Gly Leu Ser Gly Val Val Tyr Ala Leu Met
 65 70 75 80

Gly Tyr Val Trp Leu Arg Gly Glu Arg Asp Pro Gln Ser Gly Ile Tyr
 85 90 95

Leu Gln Arg Gly Leu Ile Ile Phe Ala Leu Ile Trp Ile Val Ala Gly
 100 105 110

Trp Phe Asp Leu Phe Gly Met Ser Met Ala Asn Gly Ala His Ile Ala
 115 120 125

Gly Leu Ala Val Gly Leu Ala Met Ala Phe Val Asp Ser Leu Asn Ala
 130 135 140

Arg
 145

<210> 33
 <211> 157
 <212> PRT
 <213> Homo sapiens

<400> 33
 Ser Asn Pro Ala Ser Lys Val Leu Cys Ser Pro Met Leu Leu Ser Thr
 1 5 10 15

Phe Ser His Phe Ser Leu Phe His Met Ala Ala Asn Met Tyr Val Leu
 20 25 30

Trp Ser Phe Ser Ser Ser Ile Val Asn Ile Leu Gly Gln Glu Gln Phe
 35 40 45

 Met Ala Val Tyr Leu Ser Ala Gly Val Ile Ser Asn Phe Val Ser Tyr
 50 55 60

 Leu Gly Lys Val Ala Thr Gly Arg Tyr Gly Pro Ser Leu Gly Ala Ser
 65 70 75 80

 Gly Ala Ile Met Thr Val Leu Ala Ala Val Cys Thr Lys Ile Pro Glu
 85 90 95

 Gly Arg Leu Ala Ile Ile Phe Leu Pro Met Phe Thr Phe Thr Ala Gly
 100 105 110

 Asn Ala Leu Lys Ala Ile Ile Ala Met Asp Thr Ala Gly Met Ile Leu
 115 120 125

 Gly Trp Lys Phe Phe Asp His Ala Ala His Leu Gly Gly Ala Leu Phe
 130 135 140

 Gly Ile Trp Tyr Val Thr Tyr Gly His Glu Leu Ile Trp
 145 150 155

<210> 34
 <211> 142
 <212> PRT
 <213> Sulfolobus solfataricus

<400> 34
 Tyr Leu Val Ile Lys Gly Tyr Tyr Ser Glu Leu Phe Thr Ser Ile Phe
 1 5 10 15

 Ile Thr Asn Ser Phe Val Asp Phe Ile Phe Asn Phe Ile Ser Leu Tyr
 20 25 30

 Val Ile Tyr Leu Ile Phe Gly Ser Arg Ala Gly Lys His Glu Tyr Gly
 35 40 45

 Ile Phe Ile Leu Ala Gly Ile Leu Gly Asn Leu Leu Thr Val Ile Phe
 50 55 60

 Tyr Ser Pro Phe Thr Leu Ser Ser Gly Ala Ser Gly Gly Ile Phe Gly
 65 70 75 80

 Leu Leu Ser Tyr Tyr Thr Phe Tyr Asp Phe Leu Lys Lys Asp Asn Leu
 85 90 95

 Gly Val Tyr Gly Leu Val Phe Leu Val Ser Val Phe Gly Val Ser Asp
 100 105 110

 Leu Ile Phe Pro Asn Val Asn Val Val Ala His Ile Gly Gly Ile Leu
 115 120 125

 Gly Gly Ile Met Tyr Ala Val Val Tyr Tyr Leu Ile Arg Ser
 130 135 140

<210> 35
<211> 156
<212> PRT
<213> Arabidopsis thaliana

<400> 35
Ile Phe Lys His Lys Asp Leu Lys Arg Leu Phe Leu Ser Ala Phe Tyr
1 5 10 15
His Val Asn Glu Pro His Leu Val Tyr Asn Met Met Ser Leu Leu Trp
20 25 30
Lys Gly Ile Lys Leu Glu Thr Ser Met Gly Ser Ser Glu Phe Ala Ser
35 40 45
Met Val Phe Thr Leu Ile Gly Met Ser Gln Gly Val Thr Leu Leu Leu
50 55 60
Ala Lys Ser Leu Leu Leu Phe Asp Tyr Asp Arg Ala Tyr Tyr Asn
65 70 75 80
Glu Tyr Ala Val Gly Phe Ser Gly Val Leu Phe Ala Met Lys Val Val
85 90 95
Leu Asn Ser Gln Ala Glu Asp Tyr Ser Ser Val Tyr Gly Ile Leu Val
100 105 110
Pro Thr Lys Tyr Ala Ala Trp Ala Glu Leu Ile Leu Val Gln Met Phe
115 120 125
Val Pro Asn Ala Ser Phe Leu Gly His Leu Gly Gly Ile Leu Ala Gly
130 135 140
Ile Ile Tyr Leu Lys Leu Lys Gly Ser Tyr Ser Gly
145 150 155

<210> 36
<211> 10
<212> DNA
<213> Homo sapiens

<400> 36
tggccaataaa 10

<210> 37
<211> 854
<212> PRT
<213> Homo sapiens

<400> 37
Met Ser Glu Ala Arg Arg Asp Ser Thr Ser Ser Leu Gln Arg Lys Lys
1 5 10 15
Pro Pro Trp Leu Lys Leu Asp Ile Pro Ser Ala Val Pro Leu Thr Ala
20 25 30

Glu Glu Pro Ser Phe Leu Gln Pro Leu Arg Arg Gln Ala Phe Leu Arg
 35 40 45

Ser Val Ser Met Pro Ala Glu Thr Ala His Ile Ser Ser Pro His His
 50 55 60

Glu Leu Arg Arg Pro Val Leu Gln Arg Gln Thr Ser Ile Thr Gln Thr
 65 70 75 80

Ile Arg Arg Gly Thr Ala Asp Trp Phe Gly Val Ser Lys Asp Ser Asp
 85 90 95

Ser Thr Gln Lys Trp Gln Arg Lys Ser Ile Arg His Cys Ser Gln Arg
 100 105 110

Tyr Gly Lys Leu Lys Pro Gln Val Leu Arg Glu Leu Asp Leu Pro Ser
 115 120 125

Gln Asp Asn Val Ser Leu Thr Ser Thr Glu Thr Pro Pro Pro Leu Tyr
 130 135 140

Val Gly Pro Cys Gln Leu Gly Met Gln Lys Ile Ile Asp Pro Leu Ala
 145 150 155 160

Arg Gly Arg Ala Phe Arg Val Ala Asp Asp Thr Ala Glu Gly Leu Ser
 165 170 175

Ala Pro His Thr Pro Val Thr Pro Gly Ala Ala Ser Leu Cys Ser Phe
 180 185 190

Ser Ser Ser Arg Ser Gly Phe His Arg Leu Pro Arg Arg Arg Lys Arg
 195 200 205

Glu Ser Val Ala Lys Met Ser Phe Arg Ala Ala Ala Leu Met Lys
 210 215 220

Gly Arg Ser Val Arg Asp Gly Thr Phe Arg Arg Ala Arg Arg Ser Phe
 225 230 235 240

Thr Pro Ala Ser Phe Leu Glu Glu Asp Thr Thr Asp Phe Pro Asp Glu
 245 250 255

Leu Asp Thr Ser Phe Phe Ala Arg Glu Gly Ile Leu His Glu Glu Leu
 260 265 270

Ser Thr Tyr Pro Asp Glu Val Phe Glu Ser Pro Ser Glu Ala Ala Leu
 275 280 285

Lys Asp Trp Glu Lys Ala Pro Glu Gln Ala Asp Leu Thr Gly Gly Ala
 290 295 300

Leu Asp Arg Ser Glu Leu Glu Arg Ser His Leu Met Leu Pro Leu Glu
 305 310 315 320

Arg Gly Trp Arg Lys Gln Lys Glu Gly Ala Ala Ala Pro Gln Pro Lys
 325 330 335

Val Arg Leu Arg Gln Glu Val Val Ser Thr Ala Gly Pro Arg Arg Gly
 340 345 350

Gln Arg Ile Ala Val Pro Val Arg Lys Leu Phe Ala Arg Glu Lys Arg
 355 360 365

Pro Tyr Gly Leu Gly Met Val Gly Arg Leu Thr Asn Arg Thr Tyr Arg
 370 375 380

Lys Arg Ile Asp Ser Phe Val Lys Arg Gln Ile Glu Asp Met Asp Asp
 385 390 395 400

His Arg Pro Phe Phe Thr Tyr Trp Leu Thr Phe Val His Ser Leu Val
 405 410 415

Thr Ile Leu Ala Val Cys Ile Tyr Gly Ile Ala Pro Val Gly Phe Ser
 420 425 430

Gln His Glu Thr Val Asp Ser Val Leu Arg Asn Arg Gly Val Tyr Glu
 435 440 445

Asn Val Lys Tyr Val Gln Gln Glu Asn Phe Trp Ile Gly Pro Ser Ser
 450 455 460

Glu Ala Leu Ile His Leu Gly Ala Lys Phe Ser Pro Cys Met Arg Gln
 465 470 475 480

Asp Pro Gln Val His Ser Phe Ile Arg Ser Ala Arg Glu Arg Glu Lys
 485 490 495

His Ser Ala Cys Cys Val Arg Asn Asp Arg Ser Gly Cys Val Gln Thr
 500 505 510

Ser Glu Glu Glu Cys Ser Ser Thr Leu Ala Val Trp Val Lys Trp Pro
 515 520 525

Ile His Pro Ser Ala Pro Glu Leu Ala Gly His Lys Arg Gln Phe Gly
 530 535 540

Ser Val Cys His Gln Asp Pro Arg Val Cys Asp Glu Pro Ser Ser Glu
 545 550 555 560

Asp Pro His Glu Trp Pro Glu Asp Ile Thr Lys Trp Pro Ile Cys Thr
 565 570 575

Lys Asn Ser Ala Gly Asn His Thr Asn His Pro His Met Asp Cys Val
 580 585 590

Ile Thr Gly Arg Pro Cys Cys Ile Gly Thr Lys Gly Arg Cys Glu Ile
 595 600 605

Thr Ser Arg Glu Tyr Cys Asp Phe Met Arg Gly Tyr Phe His Glu Glu
 610 615 620

Ala Thr Leu Cys Ser Gln Val His Cys Met Asp Asp Val Cys Gly Leu
 625 630 635 640

Leu Pro Phe Leu Asn Pro Glu Val Pro Asp Gln Phe Tyr Arg Leu Trp
 645 650 655

 Leu Ser Leu Phe Leu His Ala Gly Ile Leu His Cys Leu Val Ser Ile
 660 665 670

 Cys Phe Gln Met Thr Val Leu Arg Asp Leu Glu Lys Leu Ala Gly Trp
 675 680 685

 His Arg Ile Ala Ile Ile Tyr Leu Leu Ser Gly Val Thr Gly Asn Leu
 690 695 700

 Ala Ser Ala Ile Phe Leu Pro Tyr Arg Ala Glu Val Gly Pro Ala Gly
 705 710 715 720

 Ser Gln Phe Gly Ile Leu Ala Cys Leu Phe Val Glu Leu Phe Gln Ser
 725 730 735

 Trp Gln Ile Leu Ala Arg Pro Trp Arg Ala Phe Phe Lys Leu Leu Ala
 740 745 750

 Val Val Leu Phe Leu Phe Thr Phe Gly Leu Leu Pro Trp Ile Asp Asn
 755 760 765

 Phe Ala His Ile Ser Gly Phe Ile Ser Gly Leu Phe Leu Ser Phe Ala
 770 775 780

 Phe Leu Pro Tyr Ile Ser Phe Gly Lys Phe Asp Leu Tyr Arg Lys Arg
 785 790 795 800

 Cys Gln Ile Ile Ile Phe Gln Val Val Phe Leu Gly Leu Leu Ala Gly
 805 810 815

 Leu Val Val Leu Phe Tyr Val Tyr Pro Val Arg Cys Glu Trp Cys Glu
 820 825 830

 Phe Leu Thr Cys Ile Pro Phe Thr Asp Lys Phe Cys Glu Lys Tyr Glu
 835 840 845

 Leu Asp Ala Gln Leu His
 850

<210> 38
 <211> 292
 <212> PRT
 <213> Homo sapiens

<400> 38
 Met Asn Leu Asn Met Gly Arg Glu Met Lys Glu Glu Leu Glu Glu
 1 5 10 15

 Glu Lys Met Arg Glu Asp Gly Gly Lys Asp Arg Ala Lys Ser Lys
 20 25 30

 Lys Val His Arg Ile Val Ser Lys Trp Met Leu Pro Glu Lys Ser Arg
 35 40 45

Gly Thr Tyr Leu Glu Arg Ala Asn Cys Phe Pro Pro Pro Val Phe Ile
 50 55 60

Ile Ser Ile Ser Leu Ala Glu Leu Ala Val Phe Ile Tyr Tyr Ala Val
 65 70 75 80

Trp Lys Pro Gln Lys Gln Trp Ile Thr Leu Asp Thr Gly Ile Leu Glu
 85 90 95

Ser Pro Phe Ile Tyr Ser Pro Glu Lys Arg Glu Glu Ala Trp Arg Phe
 100 105 110

Ile Ser Tyr Met Leu Val His Ala Gly Val Gln His Ile Leu Gly Asn
 115 120 125

Leu Cys Met Gln Leu Val Leu Gly Ile Pro Leu Glu Met Val His Lys
 130 135 140

Gly Leu Arg Val Gly Leu Val Tyr Leu Ala Gly Val Ile Ala Gly Ser
 145 150 155 160

Leu Ala Ser Ser Ile Phe Asp Pro Leu Arg Tyr Leu Val Gly Ala Ser
 165 170 175

Gly Gly Val Tyr Ala Leu Met Gly Gly Tyr Phe Met Asn Val Leu Val
 180 185 190

Asn Phe Gln Glu Met Ile Pro Ala Phe Gly Ile Phe Arg Leu Leu Ile
 195 200 205

Ile Ile Leu Ile Ile Val Leu Asp Met Gly Phe Ala Leu Tyr Arg Arg
 210 215 220

Phe Phe Val Pro Glu Asp Gly Ser Pro Val Ser Phe Ala Ala His Ile
 225 230 235 240

Ala Gly Gly Phe Ala Gly Met Ser Ile Gly Tyr Thr Val Phe Ser Cys
 245 250 255

Phe Asp Lys Ala Leu Leu Lys Asp Pro Arg Phe Trp Ile Ala Ile Ala
 260 265 270

Ala Tyr Leu Ala Cys Val Leu Phe Ala Val Phe Phe Asn Ile Phe Leu
 275 280 285

Ser Pro Ala Asn
 290

<210> 39
 <211> .
 <212> PRT
 <213> Homo sapiens

<400> 39
 Met Ser Val Ala His Met Ser Leu Gln Ala Ala Ala Ala Leu Leu Lys
 1 5 10 15

Gly Arg Ser Val Leu Asp Ala Thr Gly Gln Arg Cys Arg Val Val Lys
 20 25 30

Arg Ser Phe Ala Phe Pro Ser Phe Leu Glu Glu Asp Val Val Asp Gly
 35 40 45

Ala Asp Thr Phe Asp Ser Ser Phe Phe Ser Lys Glu Glu Met Ser Ser
 50 55 60

Met Pro Asp Asp Val Phe Glu Ser Pro Pro Leu Ser Ala Ser Tyr Phe
 65 70 75 80

Arg Gly Ile Pro His Ser Ala Ser Pro Val Ser Pro Asp Gly Val Gln
 85 90 95

Ile Pro Leu Lys Glu Tyr Gly Arg Ala Pro Val Pro Gly Pro Arg Arg
 100 105 110

Gly Lys Arg Ile Ala Ser Lys Val Lys His Phe Ala Phe Asp Arg Lys
 115 120 125

Lys Arg His Tyr Gly Leu Gly Val Val Gly Asn Trp Leu Asn Arg Ser
 130 135 140

Tyr Arg Arg Ser Ile Ser Ser Thr Val Gln Arg Gln Leu Glu Ser Phe
 145 150 155 160

Asp Ser His Arg Pro Tyr Phe Thr Tyr Trp Leu Thr Phe Val His Val
 165 170 175

Ile Ile Thr Leu Leu Val Ile Cys Thr Tyr Gly Ile Ala Pro Val Gly
 180 185 190

Phe Ala Gln His Val Thr Thr Gln Leu Val Leu Arg Asn Lys Gly Val
 195 200 205

Tyr Glu Ser Val Lys Tyr Ile Gln Gln Glu Asn Phe Trp Val Gly Pro
 210 215 220

Ser Ser Ile Asp Leu Ile His Leu Gly Ala Lys Phe Ser Pro Cys Ile
 225 230 235 240

Arg Lys Asp Gly Gln Ile Glu Gln Leu Val Leu Arg Glu Arg Asp Leu
 245 250 255

Glu Arg Asp Ser Gly Cys Cys Val Gln Asn Asp His Ser Gly Cys Ile
 260 265 270

Gln Thr Gln Arg Lys Asp Cys Ser Glu Thr Leu Ala Thr Phe Val Lys
 275 280 285

Trp Gln Asp Asp Thr Gly Pro Pro Met Asp Lys Ser Asp Leu Gly Gln
 290 295 300

Lys Arg Thr Ser Gly Ala Val Cys His Gln Asp Pro Arg Thr Cys Glu
 305 310 315 320

Glu Pro Ala Ser Ser Gly Ala His Ile Trp Pro Asp Asp Ile Thr Lys
 325 330 335

 Trp Pro Ile Cys Thr Glu Gln Ala Arg Ser Asn His Thr Gly Phe Leu
 340 345 350

 His Met Asp Cys Glu Ile Lys Gly Arg Pro Cys Cys Ile Gly Thr Lys
 355 360 365

 Gly Ser Cys Glu Ile Thr Thr Arg Glu Tyr Cys Glu Phe Met His Gly
 370 375 380

 Tyr Phe His Glu Glu Ala Thr Leu Cys Ser Gln Val His Cys Leu Asp
 385 390 395 400

 Lys Val Cys Gly Leu Leu Pro Phe Leu Asn Pro Glu Val Pro Asp Gln
 405 410 415

 Phe Tyr Arg Leu Trp Leu Ser Leu Phe Leu His Ala Gly Val Val His
 420 425 430

 Cys Leu Val Ser Val Val Phe Gln Met Thr Ile Leu Arg Asp Leu Glu
 435 440 445

 Lys Leu Ala Gly Trp His Arg Ile Ala Ile Ile Phe Ile Leu Ser Gly
 450 455 460

 Ile Thr Gly Asn Leu Ala Ser Ala Ile Phe Leu Pro Tyr Arg Ala Glu
 465 470 475 480

 Val Gly Pro Ala Gly Ser Gln Phe Gly Leu Leu Ala Cys Leu Phe Val
 485 490 495

 Glu Leu Phe Gln Ser Trp Pro Leu Leu Glu Arg Pro Trp Lys Ala Phe
 500 505 510

 Leu Asn Leu Ser Ala Ile Val Leu Phe Leu Phe Ile Cys Gly Leu Leu
 515 520 525

 Pro Trp Ile Asp Asn Ile Ala His Ile Phe Gly Phe Leu Ser Gly Leu
 530 535 540

 Leu Leu Ala Phe Ala Phe Leu Pro Tyr Ile Thr Phe Gly Thr Ser Asp
 545 550 555 560

 Lys Tyr Arg Lys Arg Ala Leu Ile Leu Val Ser Leu Leu Ala Phe Ala
 565 570 575

 Gly Leu Phe Ala Ala Leu Val Leu Trp Leu Tyr Ile Tyr Pro Ile Asn
 580 585 590

 Trp Pro Trp Ile Glu His Leu Thr Cys Phe Pro Phe Thr Ser Arg Phe
 595 600 605

 Cys Glu Lys Tyr Glu Leu Asp Gln Val Leu His
 610 615

<210> 40
<211> 404
<212> PRT
<213> Homo sapiens

<400> 40
Met Gly Glu His Pro Ser Pro Gly Pro Ala Val Ala Ala Cys Ala Glu
1 5 10 15
Ala Glu Arg Ile Glu Glu Leu Glu Pro Glu Ala Glu Glu Arg Leu Pro
20 25 30
Ala Ala Pro Glu Asp His Trp Lys Val Leu Phe Asp Gln Phe Asp Pro
35 40 45
Gly Asn Thr Gly Tyr Ile Ser Thr Gly Lys Phe Arg Ser Leu Leu Glu
50 55 60
Ser His Ser Ser Lys Leu Asp Pro His Lys Arg Glu Val Leu Leu Ala
65 70 75 80
Leu Ala Asp Ser His Ala Asp Gly Gln Ile Gly Tyr Gln Asp Phe Val
85 90 95
Ser Leu Met Ser Asn Lys Arg Ser Asn Ser Phe Arg Gln Ala Ile Leu
100 105 110
Gln Gly Asn Arg Arg Leu Ser Ser Lys Ala Leu Leu Glu Glu Lys Gly
115 120 125
Leu Ser Leu Ser Gln Arg Leu Ile Arg His Val Ala Tyr Glu Thr Leu
130 135 140
Pro Arg Glu Ile Asp Arg Lys Trp Tyr Tyr Asp Ser Tyr Thr Cys Cys
145 150 155 160
Pro Pro Pro Trp Phe Met Ile Thr Val Thr Leu Leu Glu Val Ala Phe
165 170 175
Phe Leu Tyr Asn Gly Val Ser Leu Gly Gln Phe Val Leu Gln Val Thr
180 185 190
His Pro Arg Tyr Leu Lys Asn Ser Leu Val Tyr His Pro Gln Leu Arg
195 200 205
Ala Gln Val Trp Arg Tyr Leu Thr Tyr Ile Phe Met His Ala Gly Ile
210 215 220
Glu His Leu Gly Leu Asn Val Val Leu Gln Leu Leu Val Gly Val Pro
225 230 235 240
Leu Glu Met Val His Gly Ala Thr Arg Ile Gly Leu Val Tyr Val Ala
245 250 255
Gly Val Val Ala Gly Ser Leu Ala Val Ser Val Ala Asp Met Thr Ala
260 265 270

Pro Val Val Gly Ser Ser Gly Gly Val Tyr Ala Leu Val Ser Ala His
 275 280 285
 Leu Ala Asn Ile Val Met Asn Trp Ser Gly Met Lys Cys Gln Phe Lys
 290 295 300
 Leu Leu Arg Met Ala Val Ala Leu Ile Cys Met Ser Met Glu Phe Gly
 305 310 315 320
 Arg Ala Val Trp Leu Arg Phe His Pro Ser Ala Tyr Pro Pro Cys Pro
 325 330 335
 His Pro Ser Phe Val Ala His Leu Gly Gly Val Ala Val Gly Ile Thr
 340 345 350
 Leu Gly Val Val Val Leu Arg Asn Tyr Glu Gln Arg Leu Gln Asp Gln
 355 360 365
 Ser Leu Trp Trp Ile Phe Val Ala Met Tyr Thr Val Phe Val Leu Phe
 370 375 380
 Ala Val Phe Trp Asn Ile Phe Ala Tyr Thr Leu Leu Asp Leu Lys Leu
 385 390 395 400
 Pro Pro Pro Pro

<210> 41
 <211> 379
 <212> PRT
 <213> Homo sapiens

<400> 41
 Met Ala Trp Arg Gly Trp Ala Gln Arg Gly Trp Gly Cys Gly Gln Ala
 1 5 10 15

Trp Gly Ala Ser Val Gly Gly Arg Ser Cys Glu Glu Leu Thr Ala Val
 20 25 30

Leu Thr Pro Pro Gln Leu Leu Gly Arg Arg Phe Asn Phe Phe Ile Gln
 35 40 45

Gln Lys Cys Gly Phe Arg Lys Ala Pro Arg Lys Val Glu Pro Arg Arg
 50 55 60

Ser Asp Pro Gly Thr Ser Gly Glu Ala Tyr Lys Arg Ser Ala Leu Ile
 65 70 75 80

Pro Pro Val Glu Glu Thr Val Phe Tyr Pro Ser Pro Tyr Pro Ile Arg
 85 90 95

Ser Leu Ile Lys Pro Leu Phe Phe Thr Val Gly Phe Thr Gly Cys Ala
 100 105 110

Phe Gly Ser Ala Ala Ile Trp Gln Tyr Glu Ser Leu Lys Ser Arg Val
 115 120 125

Gln Ser Tyr Phe Asp Gly Ile Lys Ala Asp Trp Leu Asp Ser Ile Arg
 130 135 140

Pro Gln Lys Glu Gly Asp Phe Arg Lys Glu Ile Asn Lys Trp Trp Asn
 145 150 155 160

Asn Leu Ser Asp Gly Gln Arg Thr Val Thr Gly Ile Ile Ala Ala Asn
 165 170 175

Val Leu Val Phe Cys Leu Trp Arg Val Pro Ser Leu Gln Arg Thr Met
 180 185 190

Ile Arg Tyr Phe Thr Ser Asn Pro Ala Ser Lys Val Leu Cys Ser Pro
 195 200 205

Met Leu Leu Ser Thr Phe Ser His Phe Ser Leu Phe His Met Ala Ala
 210 215 220

Asn Met Tyr Val Leu Trp Ser Phe Ser Ser Ser Ile Val Asn Ile Leu
 225 230 235 240

Gly Gln Glu Gln Phe Met Ala Val Tyr Leu Ser Ala Gly Val Ile Ser
 245 250 255

Asn Phe Val Ser Tyr Leu Gly Lys Val Ala Thr Gly Arg Tyr Gly Pro
 260 265 270

Ser Leu Gly Ala Ser Gly Ala Ile Met Thr Val Leu Ala Ala Val Cys
 275 280 285

Thr Lys Ile Pro Glu Gly Arg Leu Ala Ile Ile Phe Leu Pro Met Phe
 290 295 300

Thr Phe Thr Ala Gly Asn Ala Leu Lys Ala Ile Ile Ala Met Asp Thr
 305 310 315 320

Ala Gly Met Ile Leu Gly Trp Lys Phe Phe Asp His Ala Ala His Leu
 325 330 335

Gly Gly Ala Leu Phe Gly Ile Trp Tyr Val Thr Tyr Gly His Glu Leu
 340 345 350

Ile Trp Lys Asn Arg Glu Pro Leu Val Lys Ile Trp His Glu Ile Arg
 355 360 365

Thr Asn Gly Pro Lys Lys Gly Gly Ser Lys
 370 375

<210> 42
 <211> 315
 <212> PRT
 <213> Homo sapiens

<400> 42
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Ala Thr Leu Ala Leu Asn Ile Trp Phe Phe Leu Asn Pro Gln Lys Pro
 35 40 45

Leu Tyr Ser Ser Cys Leu Ser Val Glu Lys Cys Tyr Gln Gln Lys Asp
 50 55 60

Trp Gln Arg Leu Leu Ser Pro Leu His His Ala Asp Asp Trp His
 65 70 75 80

Leu Tyr Phe Asn Met Ala Ser Met Leu Trp Lys Gly Ile Asn Leu Glu
 85 90 95

Arg Arg Leu Gly Ser Arg Trp Phe Ala Tyr Val Ile Thr Ala Phe Ser
 100 105 110

Val Leu Thr Gly Val Val Tyr Leu Leu Leu Gln Phe Ala Val Ala Glu
 115 120 125

Phe Met Asp Glu Pro Asp Phe Lys Arg Ser Cys Ala Val Gly Phe Ser
 130 135 140

Gly Val Leu Phe Ala Leu Lys Val Leu Asn Asn His Tyr Cys Pro Gly
 145 150 155 160

Gly Phe Val Asn Ile Leu Gly Phe Pro Val Pro Asn Arg Phe Ala Cys
 165 170 175

Trp Val Glu Leu Val Ala Ile His Leu Phe Ser Pro Gly Thr Ser Phe
 180 185 190

Ala Gly His Leu Ala Gly Ile Leu Val Gly Leu Met Tyr Thr Gln Gly
 195 200 205

Pro Leu Lys Lys Ile Met Glu Ala Cys Ala Gly Gly Phe Ser Ser Ser
 210 215 220

Val Gly Tyr Pro Gly Arg Gln Tyr Tyr Phe Asn Ser Ser Gly Ser Ser
 225 230 235 240

Gly Tyr Gln Asp Tyr Tyr Pro His Gly Arg Pro Asp His Tyr Glu Glu
 245 250 255

Ala Pro Arg Asn Tyr Asp Thr Tyr Thr Ala Gly Leu Ser Glu Glu Glu
 260 265 270

Gln Leu Glu Arg Ala Leu Gln Ala Ser Leu Trp Asp Arg Gly Asn Thr
 275 280 285

Arg Asn Ser Pro Pro Pro Tyr Gly Phe His Leu Ser Pro Glu Glu Met
 290 295 300

Arg Arg Gln Arg Leu His Arg Phe Asp Ser Gln
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<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 43
Gly Leu Ser Ala Pro His Thr Pro Val
1 5

<210> 44
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 44
Gly Met Gln Lys Ile Ile Asp Pro Leu
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<210> 45
<211> 9
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 45
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<210> 46
<211> 9
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<210> 47
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<220>
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<400> 47
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<210> 48
<211> 9
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<400> 48
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<210> 49
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<212> PRT
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<212> PRT
<213> Artificial Sequence

<220>
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<210> 52
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

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<210> 53
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

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Asp Lys Phe Cys Glu Lys Tyr Glu Leu Asp Ala Gln Leu His
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<211> 28
<212> DNA
<213> Artificial Sequence

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<220>
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29

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<210> 65
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 65
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30

<210> 66
 <211> 6185
 <212> DNA
 <213> Homo sapiens

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 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

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<210> 68
<211> 4820
<212> DNA
<213> Homo sapiens

<400> 68

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 <211> 4736
 <212> DNA
 <213> Homo sapiens

<400> 69

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<210> 71

<400> 71
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<210> 73
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

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<210> 77
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<220>
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<210> 78
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<400> 78
Leu Leu His Val Thr Asp Thr Gly Val
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<210> 79
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Ala Asp Asp Glu Val Asp Val Asp Gly Thr Val Glu Glu Asp Leu Gly
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Lys Ser Arg Glu Gly Ser Arg Thr Asp Asp Glu Val Val Gln
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Ser Ala Phe Leu Val Ala Asp Lys Val Ile Val Thr Ser Lys His Asn
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Asn Asp Thr Gln His Ile Trp Glu Ser Asp Ser Asn Glu Phe
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Ser Glu Lys Thr Lys Glu Ser Arg Glu Ala Val Glu Lys Glu Phe Glu
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Pro Leu Leu Asn Trp Met Lys Asp Lys Ala Leu Lys Asp Lys
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Lys Leu Tyr Val Arg Arg Val Phe Ile
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<210> 85
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Arg Leu Leu Lys Lys Gly Tyr Glu Val
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<210> 86
<211> 9
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<223> Description of Artificial Sequence: Synthetic peptide

<400> 86
Phe Leu Val Ala Asp Lys Val Ile Val
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<210> 87
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<223> Description of Artificial Sequence: Synthetic peptide

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<210> 88
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<400> 88
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<210> 89
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<210> 93
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<210> 95
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<210> 97
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<210> 99
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<210> 101
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<210> 102
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<400> 102
Val Gly Phe Tyr Ser Ala Phe Leu Val
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<400> 104
Gly Ala Ser Gly Gly
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<210> 105
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<400> 105
Gly Asp Ser Gly Gly
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Trp Leu Thr Phe Val His Ser Leu Val Thr Ile Leu Ala Val Cys Ile
1 5 10 15

Tyr Gly Ile Ala Pro Val Gly
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<210> 107
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<400> 107
Leu Trp Leu Ser Leu Phe Leu His Ala Gly Ile Leu His Cys Leu Val
1 5 10 15

Ser Ile Cys Phe Gln Met Thr
20

<210> 108
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<220>
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Leu Ser Gly Val Thr Gly Asn Leu Ala Ser Ala Ile Phe Leu Pro Tyr
1 5 10 15

Arg Ala Glu Val Gly Pro Ala
20

<210> 109
<211> 23
<212> PRT
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<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 109
Trp Arg Ala Phe Phe Lys Leu Leu Ala Val Val Leu Phe Leu Phe Thr
1 5 10 15

Phe Gly Leu Leu Pro Trp Ile
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<220>
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<400> 110
Ile Ser Gly Phe Ile Ser Gly Leu Phe Leu Ser Phe Ala Phe Leu Pro
1 5 10 15

Tyr Ile Ser Phe Gly Lys
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<220>
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Gln Ile Ile Ile Phe Gln Val Val Phe Leu Gly Leu Leu Ala Gly Leu
1 5 10 15

Val Val Leu Phe Tyr Val Tyr
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